

The University of Chicago

HAMILTON, ONTARIO
AS A MANUFACTURING CENTER

A PART OF A DISSERTATION SUBMITTED TO THE
FACULTY OF THE DIVISION OF THE PHYSICAL
SCIENCES IN CANDIDACY FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

DEPARTMENT OF GEOGRAPHY

1934

By
HAROLD BERNARD WARD

Private Edition, Distributed by
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PREFACE

The writer of this dissertation became interested in Canada and Canadian affairs during his early boyhood days in Michigan. In the summer of 1919, a reconnaissance geographic survey in Ontario revived that interest. Eventually Hamilton was selected as the logical place for an intensive study because, functionally, one activity, manufacturing, dominates. The city provides an exceptional field for such study because of its location in relation to Southwestern Ontario and the Niagara Peninsula and because of its unique physiographic setting at the base of the Niagara Escarpment.

Problem

The results of the intensive study of Hamilton are embodied in this dissertation, emphasis being placed on manufacturing. In dealing with Hamilton as a manufacturing center, four aspects have been stressed. These are: (1) the functional pattern of the city and environs with special reference to the dominance of manufacturing and to the physical features and other conditions which are of importance to manufacturing, (2) the evolution of the manufacturing complex, during critical stages in the city's industrial history, and especially the evolution during the last decade, (3) the major types of manufacturing illustrated by the leading examples of each type and their distribution in the city with emphasis on the advantages and disadvantages which each type and its components have found in Hamilton and, finally, (4) the advantages and disadvantages

of Hamilton as a manufacturing center.

Method

In 1925 and 1926, a thorough survey of the city and environs revealed that manufacturers were recovering from a depression which had retarded development somewhat. Although interest in the city and its problems was maintained during the succeeding years, it was not until 1933 that it was possible to continue field work in the area. Hamilton was found in somewhat the same condition as in 1926, although the depression from which it was emerging was far more severe than that of 1923-26. A courageous attitude was found among the business men, however, and, despite the hard struggle to maintain establishments, comparatively few had been forced to close.

Maps drawn on a scale of 1-9600 in the City Engineer's office were used as base maps for the greater part of the field work. In the survey of the city, the functional characteristics of the land and establishments fronting on each street were plotted on the base maps. Topographical maps (Hamilton and Grimsby sheets) prepared by the Geographical Section, Department of National Defense and distributed by the Topographical Survey, Department of the Interior, were used to check facts regarding the topography of the city and environs. The Hamilton Harbour chart, published by the Canadian Hydrographic Service, Department of Marine, was used for the study of channels and depths of Hamilton Bay.

Obviously, in a geographic study of any community, much dependence must be placed upon statistical information. In Canada, the Dominion Bureau of Statistics is the central statistical authority. The aim of the Bureau is to act as a "national

laboratory for social and economic research." Plans for a unified, nation-wide, statistical system, covering every major phase of economic and social activity, have been completed and, to a large extent, carried out. Present-day statistics compiled and published by the Bureau are far more detailed and reliable than statistics for years preceding the organization of the central office in 1918.

In addition to the statistics that may be secured from the Dominion Bureau of Statistics, there are many reports issued by various Dominion Departments and by the Provincial Departments. In Ontario, each of thirteen departments of the Provincial Government issues publications covering its activities. A study of a leading municipality of the Dominion calls for a critical examination of statistics collected under the authority of many of these Departments.

Acknowledgments

Difficulty was experienced in securing reliable local statistics from any except official municipal or provincial organizations, but I am indebted to a large number of private citizens as well as officials for facts and personal opinions. Although a conservative attitude was in evidence, I found Canadians always courteous and kindly, and, for the greater number, willing to express themselves fully on problems of Hamilton. To mention all the manufacturers who helped me to accumulate knowledge of the city's industries would be presenting a list of Hamilton's leading companies. The impression one gains of Hamilton manufacturers is that of cooperation, interest in employees, modern efficiency, and, above all, courtesy. I have acknowledged my indebtedness to some extent in footnotes to the text but, since

some of the information was strictly confidential and much is not directly quoted, my gratitude is extended here to all.

In the preparation of this dissertation I have received encouragement and help from many research investigators. Above all, I am deeply grateful to Professor Harlan H. Barrows for his advice and friendly attitude, and to Professor Charles C. Colby, who by his searching criticism and helpful suggestions at every stage of the writing has made the completion of this manuscript possible.

CHAPTER V

RESULTS OF THE INVESTIGATION

In this dissertation, responsibility for the study of four major aspects of Hamilton as a manufacturing center has been assumed. These four issues have been marshalled under the general statement of the problem as follows: (1) the functional pattern of the city with special reference to manufacturing, (2) the evolution of the manufacturing complex, (3) the major types of manufacturing, and leading examples of each type, and (4) the advantages and disadvantages of Hamilton as a manufacturing center.

Four divisions of the functional pattern of the city can be recognized, each distinct in its functions and each containing representative manufacturing establishments: (1) the North Division which comprises all that area north of Barton Street and is characterized by heavy complex manufacturing, mainly iron and steel products; (2) the West Division, that part of the city west of Locke Street, an area rapidly changing from a detriment to an asset for Hamilton and from a potential manufacturing district to a residential and cultural area; (3) the South Division, the area south of Main Street and east of Locke Street, where a few manufacturing establishments persist in spite of the fact that it is more desirable as a residential area; and (4) the Central Division, between Main and Barton Streets. which includes the financial and retail center of the city as well as scattered examples of various types of manufacturing (Fig. 1).

The appearance of Hamilton is not that of a typical industrial city although the dominance of manufacturing is apparent in the North Division. Coming into the city from any entrance except the northeast, one notices that trees and homes are more apparent than manufacturing establishments; yet Hamilton ranks third among the manufacturing cities of Canada (Fig. 2). Although only fifth in population, proportionately it is the most largely dependent on manufacturing industries of the leading industrial cities of Canada, nearly half of its gainfully employed population working in manufacturing plants.

The fact that Hamilton is on the narrow Lake Ontario plain has had a great influence on the divisions of the functional pattern of the city. The effective plain at Hamilton extends from the waterfront about two miles south to the Niagara Escarpment, the crest of which is 350 feet above the center of the city. The plain is restricted on the west by a deep valley but extends eastward for many miles (Fig. 3).

Barton Street, the south boundary of the North Division, extends from Locke Street, on the west, at which point it is 1,000 feet from the shore, to Winona on the east, about eight miles beyond the Hamilton city limits. The broadest extent of the North Division, near Gage Avenue, is 1.6 miles. At the east boundary of the city, its width is 6,800 feet. About 23 percent of the total four square miles in the North Division is occupied by residences and small apartment houses. In the remainder of the area, the main occupation is that of manufacturing establishments although railway property, docks, warehouses, retail stores, and recreation grounds fill a significant part of it.

Because they are on the lower outer third of the plain and because none is very far from the Bay, factories in the North

Division bear a constant relation to the waterfront. A location on or near the Bay is a decided asset, not only because of the commercial value of the harbor but because of the availability of water for mill purposes.

Based on present functions, the following three subdivisions of the North Division can be recognized: (1) the area west of James Street, (2) the area between James and Wentworth Streets, and (3) all the area east of Wentworth Street. The first subdivision for the most part is dominated by the Canadian National Railways - the waterfront as far east as the site of the old Stuart Street Station is occupied by tracks and yards. This subdivision also includes the Queen Street iron and steel manufacturing district - the original Great Western rolling mills site - which spreads eastward over Hess and Caroline Streets to Bay Street. The extreme eastern part north of the Canadian National right of way is occupied by residences except (1) along James Street where the huge factory of Canadian Cottons, Limited, and some retail stores front on the street, and (2) along the shore of Hamilton Bay which is lined with private boat houses. The Bay is bordered by a high, wave-cut cliff except where the Canadian National owns the front at which place the bluff is along the south border of the Division at Barton Street.

The second subdivision is characterized by diversified manufacturing, railway tracks and yards, storage areas, steamship docks, city property, and residences. It includes, among other important foci, (1) the site of Hamilton's first iron foundry, now the Sawyer-Massey plant, (2) the Wellington Street iron and steel center, (3) the docks, warehouses and revetment wall of the Hamilton Harbour Commission, and (4) the docks and warehouse of the Canada Steamship Lines, Limited. This is the area

that provides the best services for shipments of package freight and it is well suited to light manufacturing. Because of dredging and fill, the shoreline has been modified greatly, particularly in the neighborhood of the docks.

The third subdivision is that area characterized by Hamilton's primary iron and steel industry. It is preeminently the manufacturing section of the city, for it contains the "East End," the Ottawa Street manufacturing district, and the Sherman Avenue "square," notable concentration areas. At the west border, north of the east plant of the Canadian Westinghouse Company, is a section formerly occupied by ceramic plants. A few remnants of former valleys can be noted as a part of the cultural landscape in places where the topography is somewhat rough. The most striking modification of the shore is that produced (1) by the dredging for the docks of the International Harvester Company, Limited, the Steel Company of Canada, Limited, and the Hamilton By-Product Coke Ovens, Limited, and (2) by the land which was made from the dredged material and from the iron furnace slag, some of which has been dumped in the Bay. Upper parts of inlets have been partially filled in but rough topography in places complicates building. Railway spurs serve all the manufacturing plants in this area and highways have been improved to serve the many manufacturing establishments. Centrifugal influences are operating to bring more manufacturing to the east part of the North Division.

The West Division contains but two steel plants, two large electrical products factories, two large and two small textile factories, and a few miscellaneous products factories in addition to the Toronto Hamilton and Buffalo shops and engine terminal. Topographically, the West Division is characterized

by the Chedoke Valley which owes its existence to two streams joining at a point about 400 feet south of Main Street West. One of these streams which flows almost straight north from the escarpment was used for water power in the very early period of Hamilton's existence but no longer is of any service in manufacturing. The main valley is 50 feet deep and thus acts as a retarding influence on highway transportation. Factory locations and railway routes have been influenced to a marked degree by this valley and, as a result of its presence and of the fact that until recently parts of it were used as dumping grounds, the West Division contains a considerable amount of unoccupied land.

Recent educational and religious building programs have done much to change the appearance of parts of the valley. Since few logical manufacturing sites exist in other parts of the West Division, it is evident that manufacturing in the areas west of Locke Street should be confined to a comparatively small part of the Chedoke Valley.

The South Division is primarily a residential area. It is higher in altitude than north Hamilton and excellent sites for homes are provided on the talus and piedmont slopes. The Toronto Hamilton and Buffalo Railway has been a disturbing factor since the time it was built into Hamilton through this desirable residential district. Nevertheless, it became an orienting influence for manufacturing sites. It was not long before the railway company found it necessary to construct a spur line to connect with the North Division manufacturing area and, although it was built east of the city limits as they were at that time, the city soon expanded to the east beyond the spur line right of way. Hence, the main railway and its spur have been a maximum disturbance to residential occupancy. The comparatively few manufactur-

ing establishments in the South Division are adjacent to the Toronto Hamilton and Buffalo right of way and most of them are relatively unobjectionable. Textile, candy, and food products factories for the most part - only one steel mill - and a few distributing yards are characteristic of the industrial development of the South Division.

The Central Division contains the greatest assortment of diversified manufacturing of all four divisions. A mammoth steel-wire plant, several large textile mills, a large tobacco products factory, and a great many small factories of various types constitute the manufacturing developments. More typically this division is one of distributing and financial activities. It contains the larger wholesale and commission houses, the department stores and the greater number of smaller retail stores, the hotels and service stations, and the banks and brokerage establishments. The corner of James and King Streets is regarded as the center of the city, - the City Hall is at the intersection of James and York Streets and the Dominion Building is at King and John Streets. Office buildings in which some manufacturers' agents have their headquarters are adjacent to the banks and public buildings. Other sections of this division are classed as residential property.

In the North Division the waterfront has been the principal orienting factor. Rail and highway transportation has been equally important in parts of the area. The chief factor in site determination of many plants has been the magnetic influence of large established concerns, but various other considerations such as cheap land and advertising prominence have also been influential. In the other divisions, the alignment and distribution of manufacturing establishments have been influenced primarily by

railways, highways, and proximity to high-class labor in good residential areas. Notably in the Central Division the wholesale and financial houses, as well as the inertia of pioneer establishments have exerted strong centripetal influences.

Hamilton business men maintain that the city's industrial development has been one of steady progress and that in no sense of the word is Hamilton a "boom" town. A study of the growth in manufacturing reveals, nevertheless, that expansion has occurred in specific periods during which improvements in shipping facilities, in the availability or cost of power or fuel, in tariff restrictions or in general business conditions have strikingly increased the assets of Hamilton. Such periods are those of (1) early railroad development 1853-1857, (2) later railroad building, the first hydroelectric power, the first blast furnace and favorable political aspects, 1896-1907, (3) building expansion, additional cheap "Hydro" power, corporation mergers, harbor development, and national protectionist policies, 1910-1913, (4) war activity and post-war expansion, 1916-1921, and (5) the most recent prosperity, 1926-1930, during which remarkable changes in harbor facilities coincided with the opening of the new Welland Canal and the enlargement of the canal entrance to the harbor. With the exception of the reoccupance of several old factories that had been closed during the preceding depression, few major changes in the manufacturing complex occurred during the most recent period, although notable additions to existent plants and several new manufacturing industries kept Hamilton in its position among the leading industrial cities.

The evolution of the manufacturing complex in Hamilton has been aided by (1) the vision, energy and initiative of leading citizens, (2) the establishment of large single manufactor-

ies which have attracted many smaller factories, (3) the attraction of capital, not only Canadian but British and American, and (4) advertising - Hamilton was the first Canadian city to employ an Industrial Commissioner and Publicity Director. Governmental participation has at times acted as an aid and at other times as a retarding influence. Tariffs, bounties, taxes, preferential rates, grants for improvements by the city, the province or the Dominion - all have had a great bearing on the progress of Hamilton industries. Hamilton's periods of rapid industrial development and periods of quiescence have been influenced greatly by nation-wide and world-wide periods of inflation and depression.

An analysis of the various classes of manufacturing industries based on the ten groups recognized by the Dominion Bureau of Statistics discloses the fact that the dominant group in Hamilton is the manufacture of iron and its products. Although iron and steel plants are in operation in each of the four industrial divisions of the city, the greater number and the largest are in the northeastern part of the North Division, that part of Hamilton often called "Steelton" or "Irondale" (Fig. 4). It is fitting that this section should be chosen for the site of a primary iron establishment for (a) it borders the waterfront, (b) acreage sufficient for wide-spread operations was available, (c) it could be enlarged by filling in water lots, (d) both systems of railroads, the Canadian National and the Toronto Hamilton and Buffalo, serve the area, (e) through highways border the plant sites and (f) within easy walking distance is a good residential section. The largest and most powerful Canadian manufacturing concern in Hamilton, the Steel Company of Canada, Limited, has its main plant on an "East End" waterfront site. The International Harvester Company's property borders the Steel

Company on the west and the National Steel Car Corporation's plant is about one mile east. Each of these sites has many of the general advantages of the district.

Many steel plants are in the North Division not on the Bay. The occupance pattern is dominated mainly by railroads although the sites can be classed areally on the basis of through north-south highways. Certain nuclei can be recognized in the pattern so that clusters of plants appear which in some cases are dominated by large establishments. Such concentrations, beginning with the easternmost, occur at Ottawa, Sherman, Wellington, and Queen Streets.

Factories on and near Ottawa Street have the advantages of railway service, for the street is crossed by the main line of the Canadian National Railways and by the Toronto Hamilton and Buffalo, and of a through cross-town highway as well as of wide thoroughfares which connect with Ottawa Street. The topography of the terrane is not entirely favorable for a manufacturing site but is rapidly being leveled.

The dominating factory at Ottawa Street is that of the Dominion Foundries and Steel, Limited, producers of alloy steels, castings and finished rolled steel, and the installers of the first electric universal plate mill in Canada. The Hamilton Bridge Company, Limited, a company that has done much to advertise Hamilton among builders and engineers, occupies a large plant which borders the Dominion Foundries and Steel Company's property on the west.

The area characterized by the most striking concentration of steel products plants in the city is one mile west of Ottawa Street and directly south of the International Harvester Company's property. Sherman Avenue is the main highway orient-

ing the district, but railroad spurs and main lines act as the motivating factor in localization. With the exception of the waterfront, this area is probably the most favorable section of the city for manufacturing.

Wellington Street has been an important highway for many decades, is well served with railroad spurs and leads directly to one of the municipal steamship docks. Pioneer mills established on Wellington Street, one in 1828 which has persisted more than 100 years, and the other in 1866 destined to become one of the units of the Steel Company of Canada, give this street a notable industrial history. Several other plants manufacturing steel goods have followed the lead of the pioneers.

Queen Street orients the westernmost concentration. Near it is the site of the manufacturing district that resulted from the building of the Great Western rolling mills. Some of the favorable factors are retained in this area but unless the lake front is developed by the Canadian National Railways, this area should not continue to be a manufacturing nucleus. Centrifugal influences are too strong to allow it to remain a manufacturing district.

The steel mills in the West Division are poorly adjusted to the environment although the Chedoke Valley and the Toronto Hamilton and Buffalo - Canadian Pacific service are favorable factors. But, particularly since the attempts to develop the valley into a park are meeting with some success, steel factories should move elsewhere.

In the South Division there is but one steel mill, a branch of an American corporation. It is in a favorable place for rail traffic - at the junction of the Toronto Hamilton and Buffalo and the Canadian National Railways - but this is about

the only justification for its presence.

Steel plants in the Central Division are entirely out of place. All shipments must be made by truck except along the Port Dover branch of the Canadian National Railways and the Gage Avenue line of the Toronto Hamilton and Buffalo. A pioneer establishment which is now the largest in Canada producing only steel wire is in the Central Division. It retains its location because to move would mean an enormous outlay and "since 1859 in one location" has a strong advertising appeal.

The present distribution of steel plants in Hamilton is logical for the greater number. It is not essentially different from the distribution as it appeared in 1926. At that time it was clear that the North Division was the best suited section for steel mills. Since then a large area east of the occupied parts, formerly withheld from industrial development, has been made available for manufacturing establishments. Thus the eastern part of the North Division is now more clearly the only place in the city where steel plants should be established.

The problem of supplying Hamilton's iron and steel plants with raw materials is the basic factor underlying the entire structure of the industry. It has been of fundamental importance in determining whether a steel plant would be located in the city and in the choice of a local site. The essential raw materials for the production of pig iron are iron ore, coking coal, limestone, and large amounts of fresh water. After the problem of supplying these essentials has been solved, secondary products plants have no serious raw material problem since they use the products of the primary mills for further fabrication.

The geological formations of Hamilton and vicinity yield no iron ore or coal. Limestone and dolomite are available in the

environs of Hamilton and sufficient supplies of water may be obtained from the lake. Canada has enormous resources of iron ore and coal but they are either of such low grade or at such a distance as to prohibit their use in Hamilton plants. Hence the pig iron manufacturer must import iron ore and coking coal. The Steel Company of Canada, Limited, exemplifies modern integration of industry. It has controlling interests in iron ore properties in the Lake Superior iron ranges and coal properties in southwestern Pennsylvania. In 1926, the ore was being shipped by boat from the head of the lakes to Point Edward at the southern end of Lake Huron, thence to Hamilton by rail (Canadian National Railways). Coal was shipped by rail to Ashtabula, thence by fast ferry boats across Lake Erie to Port Maitland and on to Hamilton by the Toronto Hamilton and Buffalo Railway. Some limestone was shipped in by boat but most of it came from nearby points by rail. Thus the larger part of the fundamental raw materials reached Hamilton by rail, was transported through the city to the lakeshore and dumped in a large storage space near the furnaces. The movement of these raw materials was accomplished with such dispatch and efficiency that operations could be carried on economically in spite of the changes of ore from boat to cars.

Three distinct improvements in transportation facilities completed in 1931 changed the entire plan of movement of raw materials, made possible shipments of much greater tonnage at less cost per ton mile, and resulted in increased efficiency and hence lower cost of production at the plant. These improvements are (1) the new Welland Canal, (2) the enlarged and deepened Burlington Canal through Hamilton Bar, (3) the new dock and unloading equipment at the site of the plant. Until Canadian ores and coal are made available at a lower cost than imported materials, the

present arrangements for transporting these raw materials will remain the cheapest, most rapid and most efficient methods.

Hamilton is known as Canada's primary market for scrap iron and steel. In the modern basic open-hearth method of producing steel, scrap steel and iron have become as necessary as pig iron. Moreover, in several other steel processes scrap can be used. The fact that in Hamilton there are 78 iron and steel establishments in addition to the three Steel Company of Canada plants, each of which is a potential producer of scrap iron or steel, is of great value to the primary steel producers. Each producer of secondary products has individual raw material needs and in general a location (1) near a large primary producer, (2) on a railroad spur, and (3) on a through paved road is sufficiently well placed so that raw material problems are easily solved.

Hamilton's location (1) on navigable water, (2) on lines of Canada's two transcontinental railroads and a third that connects with railroads of the United States, (3) on a radiating system of trunk-line highways, and (4) near the industrial centers of eastern United States, places it in an excellent position for the supply of raw materials of every nature needed in the steel industry.

Since 1896 manufacturers in Hamilton have been privileged to use electric power at a cost less than that paid for power in any other large industrial center in North America. It was Hamilton's nearness to the Niagara Escarpment and the bold initiative of some of its citizens that made possible the launching of a pioneer hydroelectric enterprise at DeCew Falls. The original organization, the Hamilton Cataract Power, Light and Traction Company, Limited, by supplying cheap and efficient electric power

service provided the incentive for many manufacturers to locate in Hamilton. In 1912 Hamilton's location near the escarpment was again reflected in cheap power service when the Hydro-Electric Power Commission entered into local competition with the Dominion Power and Transmission Company, Limited, the distributors of "Cataract" power. The benefits of competitive rates were enjoyed by Hamilton manufacturers and attracted other manufacturers to the city until in 1930 the Hydro-Electric Power Commission absorbed the pioneer company. Whether Hamilton will continue to be favored with low power rates under the government-owned monopoly can not be foretold. Up to June, 1934, no change in rates had been effected but local manufacturers are certain that an increase is impending and that Hamilton will lose the distinction of being Canada's cheapest large power city.

The type of iron or steel product determines largely the extent and character of the market. In Canada, the expansion of railway, steamship and highway services, the development of agricultural and mining activities, the growth of urban centers and the increase in population and wealth of the people are the fundamental bases for the extension of markets for Hamilton iron and steel products. In foreign countries, commercial agreements, favored-nation clauses, and other political factors greatly influence the markets for Hamilton iron and steel products. Most local concerns can not compete in foreign markets with the larger iron and steel producers of the United States and of other leading industrial countries. The logical markets for Hamilton products are Ontario and the agricultural and mining regions of western Canada; nevertheless, a significant amount is marketed in overseas British and foreign areas.

The manufacture of textiles and their products has held

second place in magnitude among Hamilton's industries for many years. The first knitting mill was established in the city in 1888 by a company which is now one of Hamilton's leading textile concerns. An over-expansion of early Canadian cotton mills and the merging of several pioneer factories that resulted in the development of a profitable export trade to China caused a pioneer cotton mill to move from Merritton, where it had been established largely because of the favorable humidity conditions, to Hamilton in order to take advantage of the better shipping facilities and greater labor supply. The impetus of an early start and the increasingly favorable environment for textile factories in Hamilton, particularly the cheap 60-cycle electric power, are the underlying causes for concentration of mills in the city. The growth of the textile industry kept pace with that of iron and steel products, advancing rapidly at times, notably during periods of national prosperity.

The most recent major addition to Hamilton's textile industries, the Realsilk Hosiery Mills of Canada, Limited, came at a time when nearly all textile groups were feeling the effects of the world-wide depression of 1930. The continued expansion of silk mills was one of the outstanding features of the textile situation during that period. In general, however, Hamilton's textile mills lost some prestige among other groups for in 1931 only 13.7 percent of the total value of all manufactured products were textiles and less than a quarter (23.5 percent) of the total of Hamilton's employees were working in textile mills, whereas a decade before the corresponding percentages had been 17.6 and 24.5.

Large unit production characterizes Hamilton's textile manufacturing. Twelve mills manufacture more than 95 percent of

the textiles produced in Hamilton although the total number of textile factories is 55. The distribution in the city is such that representative factories are located in each industrial division. Textile mills depend so much on female labor that proximity to residential districts is an important site factor. Moreover, a large knitting mill run entirely by electric power is not as objectionable in a first-class residential area as a steel mill employing a like number of workers. Nevertheless, conditions for the supply of raw materials and of power, and the facilities for shipment of products are so much more favorable in the North Division, that sites for textile mills are far more logical in that division than in any other part of the city. Measured by this standard, several cases of maladjustment of location can be found among the more recent textile mills.

Hamilton textile manufacturers face problems that are common to all Canadian textile industries. The city is in the midst of competing towns, a few of which support mills of magnitude comparable to those of Hamilton. Labor problems are not serious in Hamilton although the number of strikes of textile workers has been larger than that of other industrial groups. The favorable factors for textile manufacturing are; (1) the surplus of female labor, in large measure members of families of steel workers, (2) sufficient supplies of filtered water pure enough for dyeing operations, (3) excellent shipping facilities by rail, highway and water, (4) the important asset of cheap and efficient 60-cycle electric power, (5) the production in the city of necessary chemicals, (6) the high humidity of the area, and (7) the location in the city of the headquarters of Canada's largest textile engineering and supply house. Because of these factors which far outweigh unfavorable factors, textile mills

will continue to find Hamilton a strategic point for production.

In Hamilton chemical products are of such great significance in steel and textile mill processes that the manufacturing of chemical compounds is a most desirable adjunct to Hamilton's major industries. The leading examples of manufacturers of chemical products or of products closely related to chemicals are located in the North Division, the greater number near or on the waterfront. Three large organizations that are leaders among the chemicals have added much to Hamilton's prominence as a manufacturing center, namely: the Grasselli works of Canadian Industries, Limited, the Firestone Tire and Rubber Company, Limited, and the Proctor and Gamble Company, Limited. The first has developed its shipping service to the stage of building a modern dock but each of the others owns frontage on the harbor and will undoubtedly eventually build docks comparable to those of Canadian Industries, Limited. Each of these three organizations is the Canadian branch of a large corporation located in a midwestern city in the United States not far from Hamilton. Hamilton not only provides a profitable local market but it serves as a distributing center for Canada, a capacity in which it resembles Cleveland, Akron, and Cincinnati which are distributors for the United States.

The Grasselli Chemical Company of Cleveland, Ohio, established their Canadian branch at Hamilton largely because of the presence in the city of steel and textile mills which offered markets for chemicals. After the organization of Canadian Industries, Limited, in 1928, operations at Hamilton were narrowed down to the production of acids and fertilizers. No better apportionment of producing units could have been devised for the city market and for the agricultural areas of Ontario.

The Firestone Tire and Rubber Company, Limited, and the Proctor and Gamble Company, Limited, have not only increased the overseas trade of Hamilton but have added much to the attractiveness of the city for high-class industrial labor. Each of these organizations has built up a high morale among its employees by systems of employee insurance and profit sharing and by maintaining attractive conditions at the plants and grounds.

Listed among the leading three manufacturing organizations of the city is the largest of the electrical products companies, the Westinghouse Electrical and Manufacturing Company of Canada, Limited. Two plants are maintained in Hamilton, one in the North Division on the Canadian National main line reaching from Birch Avenue to Wentworth Street and the other in the Chedoke Valley (West Division) south of Aberdeen Avenue near the Toronto Hamilton and Buffalo yards. Started originally as the Canadian branch of the Westinghouse Air-Brake Company of Pittsburgh, in 1896, at a time when the Canadian railways were required to place air brakes on all their freight cars, the Hamilton company grew with the parent company until it has become a powerful influence in Canadian electrical development. Hamilton was chosen as the home of the Canadian company because it was an important railway center but it is probable that Hamilton's location relatively near Pittsburgh was a strong contributing factor. In the two Hamilton plants are produced electrical equipment ranging from tiny radio lamps to giant dynamos. The largest generators in the world at the times of their installations have been manufactured and installed by the Canadian Westinghouse Company, Limited. Obviously, this company has brought much renown to Hamilton.

Other electrical products factories manufacturing many

types of electrical goods have found Hamilton an exceptionally favorable electrical market and distributing center. For the most part, these factories are located in the North Division - railway spurs or through highways acting as the chief distributive factors-but there are notable examples in other divisions of the city. The per-capita use of electric energy is very high in Hamilton and this fact, together with many other favorable factors, leads to continued development of electrical products establishments in the city.

Hamilton has developed into a distinctive manufacturing center largely because of certain definite factors the influences of which have been cumulative throughout the history of the city. In large measure the favorable factors have outweighed the disadvantages or unfavorable factors. The survey of manufacturing in Hamilton disclosed the following chief favorable factors:

1. Locational qualities (Fig. 3)

(1) Hamilton is located at the western end of Lake Ontario, - on a land-locked, deep and commodious harbor. The lake is an advantage for manufacturing not only because of its transportational importance but because of the availability of a constant supply of pure fresh water. It has been stated that "the most essential factor of life is that water should be cheap and, above all, constant."

(2) The fact that Hamilton is on the Bay is the basic reason why it became a railway terminus. The original charter of the first railway in Upper Canada specified "a city on Burlington Bay in the District of Gore." Hamilton was the only city fitting that description, hence the railroad was constructed as specified, despite the protests of Dundas and Toronto. This caused the city to become a center of railway activities which in

turn became the primary factor in the pronounced development of manufacturing.

(3) Hamilton is well placed in reference to the land routes from Toronto to Buffalo and New York. The Toronto Hamilton and Buffalo Railway is an important factor in the flow of traffic along these corridors and also functions as a belt line connecting with all the railroads that pass through the Niagara Peninsula.

(4) Hamilton's location near the center of the most densely populated part of Ontario makes accessible a rich, nearby market.

(5) Of all large Canadian cities, Hamilton is the nearest to the Ohio, Pennsylvania, and New York industrial areas and to the northern Appalachian bituminous coal province.

(6) It is in the midst of the fruit belts of the Niagara Peninsula and of the north shore of Lake Ontario and it is adjacent to the agricultural lands of the Ontario Peninsula. These areas supply food for the city and provide markets for manufactured goods. The Hamilton city market is an important center of distribution.

(7) The city spreads over the Niagara Escarpment and thus rests on two lake plains, the upper Lake Erie and the lower Lake Ontario. In large measure, Hamilton's importance as a manufacturing center is a product of the break between the two plains in that much of the power for industries is drawn from the fall of water from one plain to the other.

(8) Hamilton's latitude, its location in eastern North America and the fact that it is in the belt of frequent cyclones combine to produce a climate that is near the optimum for physical and mental work.

2. Site qualities (Fig. 5)

(1) The comparatively flattish topography of the lake plain which slopes slightly toward the Bay is ideal for manufacturing sites.

(2) The area occupied by or available for plants has a long frontage on the Bay and may be expanded several miles eastward along the lakeshore.

(3) The composition of the terrane is well suited to the construction of factories. Surficial deposits of porous sands and loams permit easy excavation and the more resistant, stiff, blue till underlain by the bedrock supports foundations for large factory buildings.

(4) The natural, irregular shoreline of the Bay has provided much frontage for docks, transit sheds, and warehouses.

(5) Railroads and roads are built easily and at low cost to manufacturing plants on the plain near the lake and their orientation is in keeping with the manufacturing pattern.

(6) Plant sites are adjacent to a deep, safe and commodious harbor.

3. Functional magnetism

(1) Manufacturing started in Hamilton early in the history of the city. The cumulative effects of an early start have been important in later development.

(2) Railroad activities and the demand for rails and rolling stock led to the establishment of a blast furnace and the consequent stabilization of iron and steel manufacturing.

(3) Hamilton was the first city in eastern North America to have cheap and efficient electric power and its renown as a power city has persisted. The influence of this favorable reputation has been wide spread and significant.

(4) A single large industry in Hamilton has often acted as a magnet attracting others to adjacent locations, drawn by a desire to profit from one or more of the following: (a) the prestige gained by association with a large concern, (b) the advantage of extra-plant transfers and neighborhood sales, and (c) cooperative purchases, distribution, employees' insurance and enterprises.

(5) Manufacturing units attract related industries, some directly related because of like products, like raw materials, and like problems; others indirectly related because of employee division, associated transportation problems, or property sharing.

(6) Successful manufacturing projects invite capital. Financially powerful, highly capitalized organizations (Canadian, British, and American) have been attracted to Hamilton by the impetus provided by such pioneer enterprises as the Westinghouse Company, the International Harvester Company, and Canadian Cottons. The result is an impressive number of large branch factories in Hamilton.

(7) Hamilton's status as second in financial standing among 250 leading cities of North America is largely because capital attracts more capital.

4. The human equation

(1) In Hamilton the vision, energy and initiative of a leading citizen have often had a great influence on the evolution of manufacturing.

(2) Hamilton was the first Canadian city to employ an Industrial Commissioner and Publicity Director. Throughout the later history of the city, industrial commissioners have secured many industries for Hamilton.

(3) Labor conditions in Hamilton are exceptionally satisfactory because (a) the city has the reputation of a good labor market among employee organizations in Canada and the United States; (b) employees are advised to register for courses at the Hamilton Technical Institutes and the High Schools of Commerce, large vocational schools near the North Division factories; (c) many manufacturing organizations provide recreation grounds, libraries and refectories for their employees; (d) employee insurance and profit-sharing plans have been instituted by various manufacturing concerns and all factories are equipped with life-saving apparatus; (e) living conditions and cultural advantages in Hamilton are particularly attractive; 65 percent of its citizens own their homes; more than 2,000 acres of parks, 17 public playgrounds and educational facilities from primary school to university are incentives for working in Hamilton factories; (f) Hamilton's religious and social influences which include churches of impressive architectural design and several independent social agencies have been an important factor in the upbuilding of the community and have helped to curb radical tendencies among employees.

Unfavorable or partially unfavorable factors, some of which have been cumulative, have at times retarded Hamilton's development rather seriously. The following are the more pronounced of unfavorable factors:

(1) The city is remote from Canadian coal and iron ore producing areas.

(2) To a certain degree, it is handicapped by its proximity to the industrial areas of the United States and by its nearness to the older and larger city of Toronto. In larger measure, these short distances help Hamilton manufacturers.

(3) It is not on the main routes of traffic between Chicago and Montreal, or between Chicago and the Niagara Falls gateway or from Montreal to Vancouver, but it is in an excellent position to profit from the flow of traffic along these corridors.

(4) The main lake-river through traffic routes from the head of the Great Lakes to the St. Lawrence do not touch Hamilton.

(5) Although the city is the "hub of Ontario highways," through highways from Buffalo to Toronto and from Detroit to Buffalo or to Toronto are not most direct if they pass through the Hamilton business district.

(6) The Niagara Escarpment is a barrier difficult to overcome. Hamilton will always be faced with the problem of easy access to the upper plain.

(7) Despite the general flattishness of the lower plain, the many inlets, the Iroquois shore features, and the slumping of talus along the escarpment present difficult problems of land reclamation and utilization.

(8) In places Hamilton Bay is nearly 80 feet deep, but near the shore it has required much dredging to deepen it enough for shipping purposes. The east end of the Bay is bordered in places with swampy areas. Extensive dredging will be necessary to make this portion satisfactory for dock development and for use by manufacturing concerns.

(9) Expansion of manufacturing areas can logically proceed only eastward. As the distance from the center of the city increases, problems of transportation and of city services will need to be overcome.

(10) The evolution of manufacturing has often been re-

tarded by political jealousies, personal animosities and municipal administrative stupidity. The success of Hamilton manufacturers in the final analysis is dependent on the judgment of municipal, provincial and national ruling bodies. In this respect Hamilton is unique because manufacturers are strongly represented in city administration.

It is clear that the advantages of Hamilton far outweigh its disadvantages, that its areal expanse is such that the functional pattern is exceedingly favorable for manufacturing, and that the entire environmental and social complex is of the quality that will maintain Hamilton permanently as an independent Canadian manufacturing center.

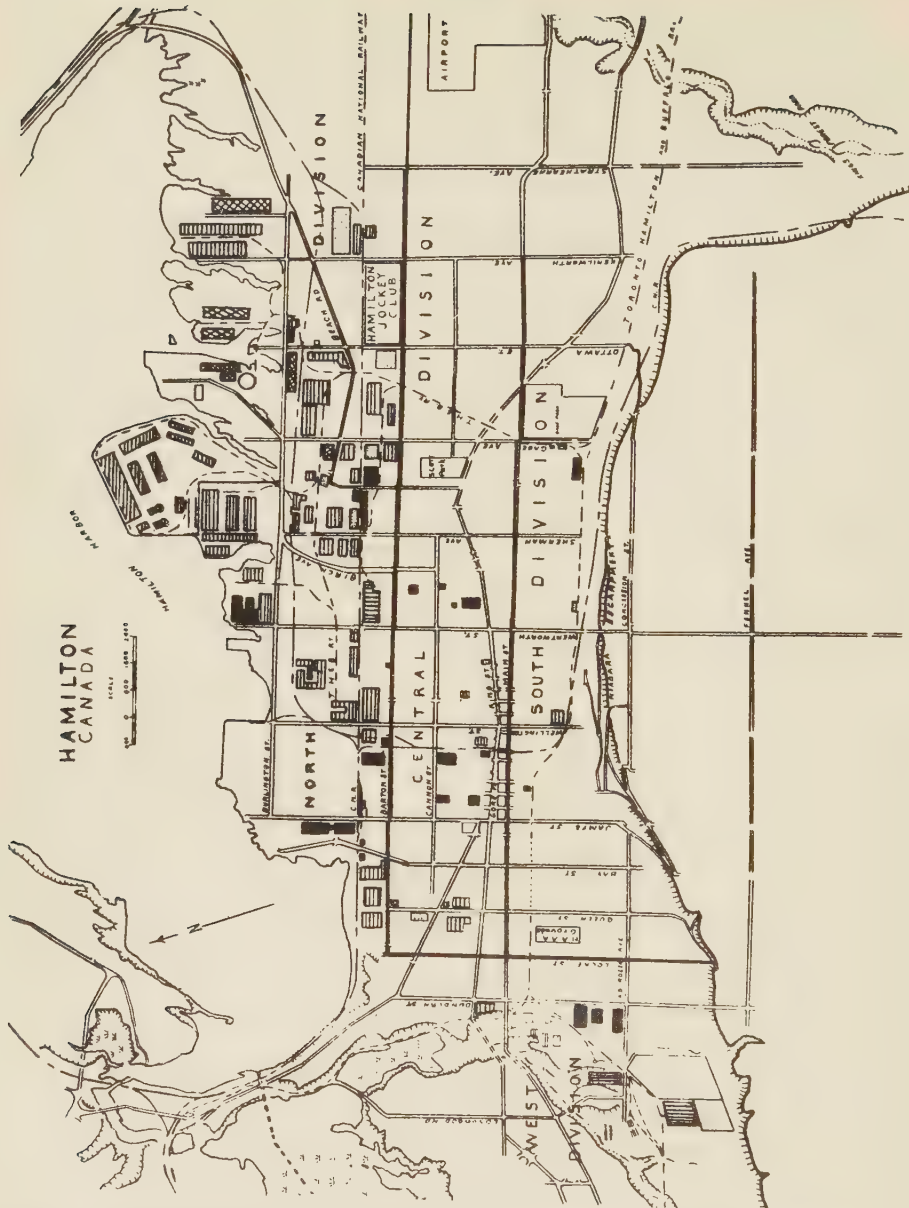


Fig. 1 - Distribution of Hamilton's manufacturing establishments

- | | |
|---|---|
|  Iron and steel and their products |  Electrical products |
|  Textiles and textile products |  Chemical products |
|  Other types of products | |



Fig. 2 - View of a part of Hamilton as it appeared in 1933

Figure 2

This picture was taken from the Niagara Escarpment near the head of Wellington Street. It shows the business center of Hamilton, the west end of the harbor in the mid-distance and the fruit belt and farming area to the north and west of Hamilton in the distance.

- 1 - Hamilton Harbor
- 2 - The High Level Bridge over the Des Jardins Canal
- 3 - Hamilton's retail and financial business center, corner of King and James Streets
- 4 - The Pigott Building
- 5 - City Hall tower
- 6 - Royal Connaught Hotel
- 7 - Medical Arts Building
- 8 - Basilica of Christ the King
- 9 - Toronto Hamilton and Buffalo Railway station and tracks



Fig. 3 - Parts of the Hamilton and Grimsby topographic maps



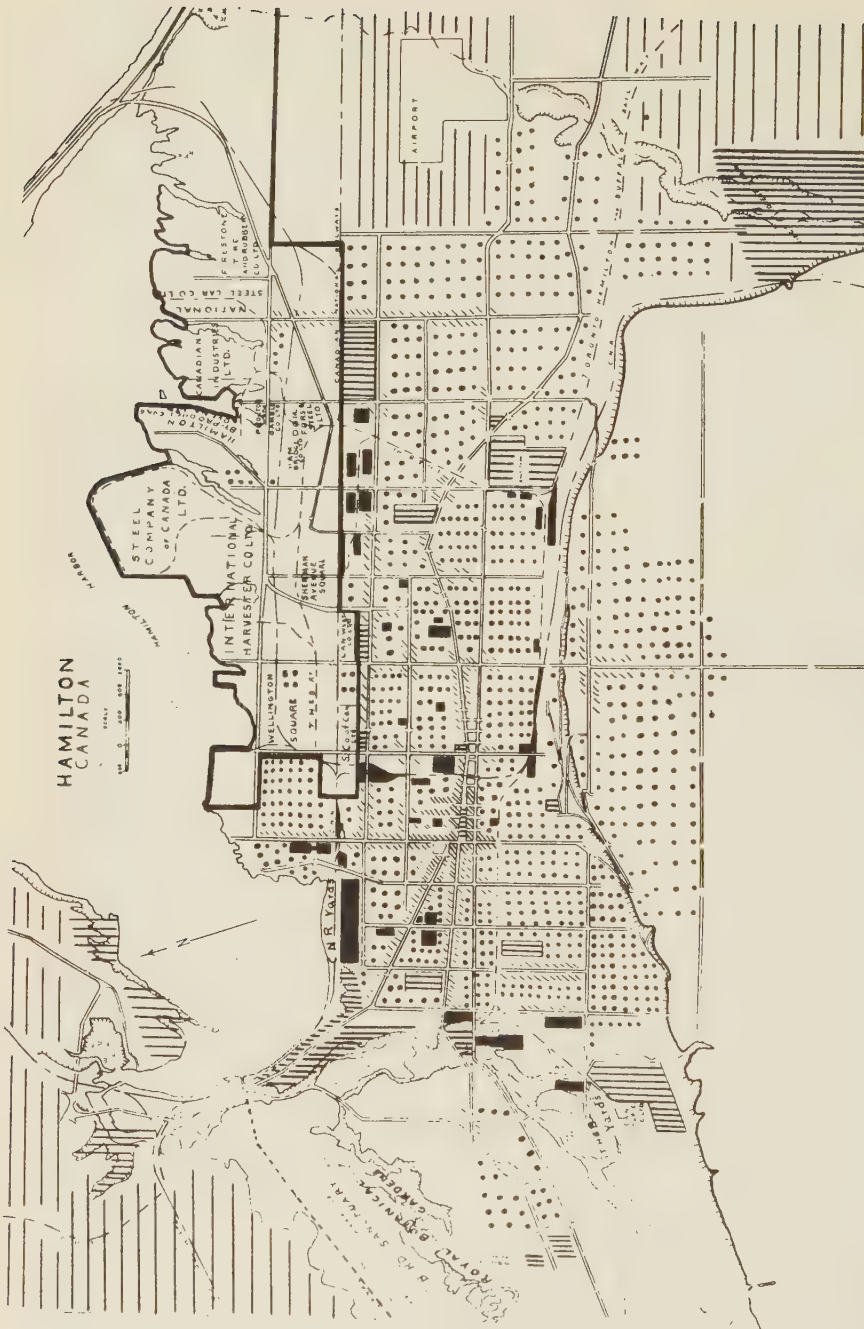


Fig. 4 - The functional pattern of Hamilton

Figure 4

Area within heavy black line: Primarily manufacturing (larger holdings named), docks, transfer yards, and warehouses.



Manufacturing and railway yards in other parts of Hamilton



Parks, Recreational Grounds, and Cemeteries, except those named



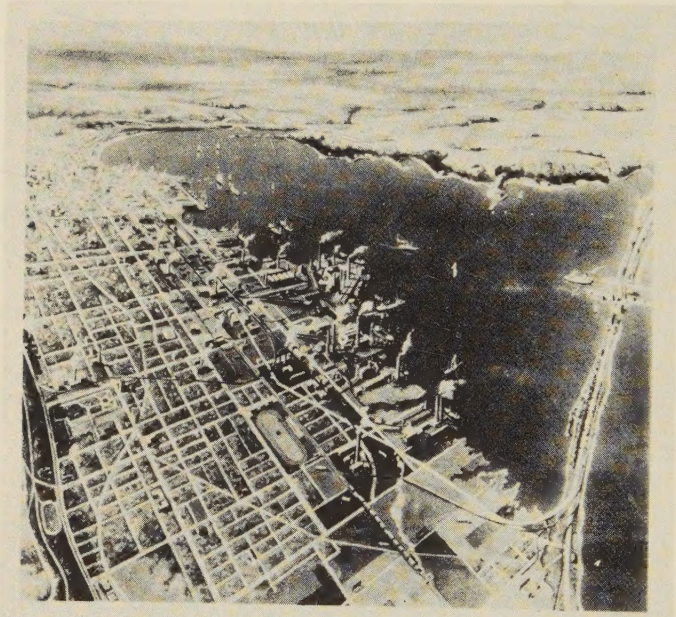
Retail and wholesale business



Residential



Horticultural



Courtesy Hamilton Harbour Commission

Fig. 5 - Hamilton from the air. The city pattern and the dominance of manufacturing are apparent. 1. Hamilton harbor. 2. Entrance to the harbor. 3. Docks of the Hamilton Harbour Commission. 4. Docks of the Canada Steamship Lines, Limited. 5. The Hamilton works of the Steel Company of Canada, Limited. 6. Hamilton By-Product Coke Ovens, Limited. 7. Hamilton Water Works (filtration plant and pumping station). 8. Canadian National Railways.

